Differential Equations 2015 vol.51 N7, pages 872-885

Study of the convergence of the finite-element method for parabolic equations with a nonlinear nonlocal spatial operator

Glazyrina O., Pavlova M.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2015, Pleiades Publishing, Ltd. We consider a parabolic equation whose spatial operator depends nonlinearly not only on the unknown function and its gradient but also on a nonlocal (integral) characteristic of the solution. By using the semidiscretization method with respect to the variable t and the finite element method in the space variables, we construct an approximate solution method in which the nonlocality is pulled down to the lower layer. We prove a theorem on the convergence of the constructed algorithm under minimal assumptions on the smoothness of the original data.

http://dx.doi.org/10.1134/S001226611507006X